



# Volunteer Lake Assessment Program Individual Lake Reports

## MONOMONAC, LAKE, RINDGE, NH

### MORPHOMETRIC DATA

Watershed Area (Ac.):	12,448	Max. Depth (m):	7.8	Flushing Rate (yr <sup>-1</sup> ):	3.6	Year	Trophic class	Known Exotic Species
Surface Area (Ac.):	711	Mean Depth (m):	2.8	P Retention Coef:	0.55	2008	MESOTROPHIC	Variable Milfoil
Shore Length (m):	17,200	Volume (m <sup>3</sup> ):	8,093,500	Elevation (ft):	1044	1976	MESOTROPHIC	

### TROPHIC CLASSIFICATION

### KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

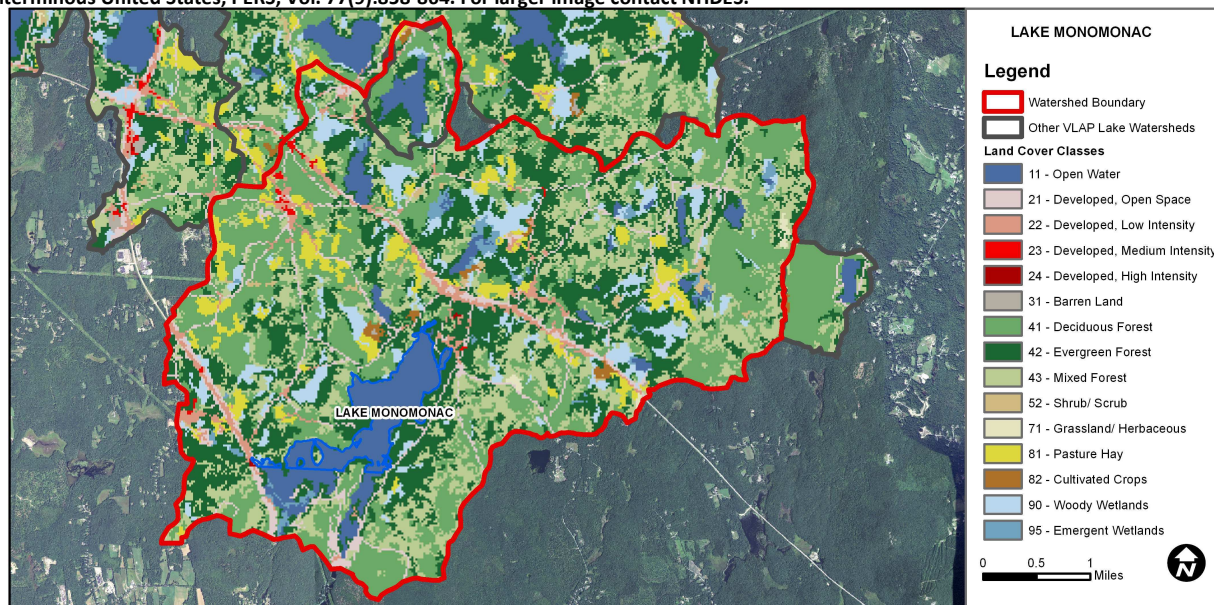
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

### BEACH PRIMARY CONTACT ASSESSMENT STATUS

MONOMONAC LAKE - CAMP MONOMONAC BEACH	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
MONOMONAC LAKE - CAMP MONOMONAC BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

### WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	7.22	Barren Land	0.02	Grassland/Herbaceous	0.22
Developed-Open Space	5.18	Deciduous Forest	26.98	Pasture Hay	4.54
Developed-Low Intensity	2.46	Evergreen Forest	25.82	Cultivated Crops	0
Developed-Medium Intensity	0.21	Mixed Forest	19.28	Woody Wetlands	5.94
Developed-High Intensity	0.03	Shrub-Scrub	0.5	Emergent Wetlands	1.23



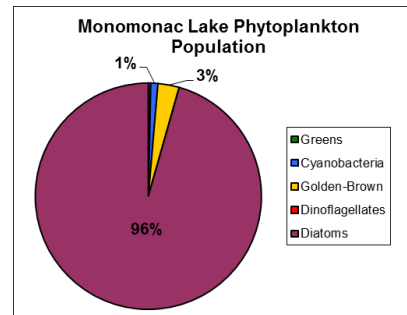
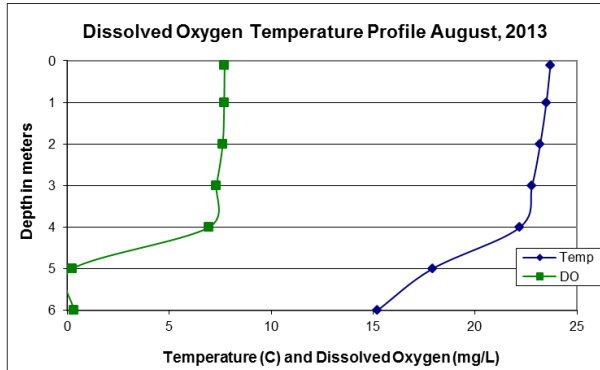
# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

## MONOMONAC LAKE, RINDGE, NH

### 2013 DATA SUMMARY

#### OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- CHLOROPHYLL-A:** Chlorophyll levels were elevated in July and August and greater than the state median. Visual analysis of historical data indicates chlorophylls levels have increased (worsened) since monitoring began.
- CONDUCTIVITY/CHLORIDE:** Conductivity and chloride levels were slightly elevated at all stations, particularly Colburn Inlet in July following a rain event. Visual inspection of historical data indicates epilimnetic conductivity has increased (worsened) since monitoring began.
- E. COLI:** E. coli levels were low and well below state standards for surface waters.
- TOTAL PHOSPHORUS:** Epilimnetic and hypolimnetic phosphorus levels were average and approximately equal to the state median. Phosphorus levels in Colburn Inlet, Loon Bay and State Line Inlet were elevated in July following a rain event. Visual inspection of historical data indicates variable epilimnetic phosphorus.
- TRANSPARENCY:** Transparency was low and less than the state median likely due to the increased algal growth. Visual inspection of historical data indicates decreasing (worsening) transparency.
- TURBIDITY:** Hypolimnetic turbidity was slightly elevated in August. Turbidities in Begun and State Line Inlets were slightly elevated in July following a rain event.
- pH:** Deep spot and tributary pH levels were lower than desirable range 6.5 – 8.0 units and potentially critical to aquatic life. Visual inspection of historical data indicates variable epilimnetic pH.
- DISSOLVED OXYGEN:** Dissolved oxygen levels decreased to below 1.0 mg/L in August. When oxygen levels deplete below 1.0 mg/L the potential exists for phosphorus normally bound in bottom sediments to be released into the water column.
- RECOMMENDED ACTIONS:** Several tributaries experienced elevated phosphorus and/or turbidity following a rain event in July. To better assess tributary water quality, collect samples in the tributary itself and not in the lake where the tributary enters. Chlorophyll levels appear to be increasing and transparency decreasing. Algae utilize the nutrient phosphorus to grow. With the increased frequency of high volume and high intensity storm events, residents should be educated on ways to reduce stormwater runoff from their properties. DES' "Homeowner's Guide to Stormwater Management" is a useful resource.



**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.

**Alkalinity:** 4.9 mg/L

**Chlorophyll-a:** 4.58 mg/m<sup>3</sup>

**Conductivity:** 40.0 uS/cm

**Chloride:** 4 mg/L

**Total Phosphorus:** 12 ug/L

**Transparency:** 3.2 m

**pH:** 6.6

**NH Water Quality Standards:** Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

**Chloride:** < 230 mg/L (chronic)

**E. coli:** > 88 cts/100 mL – public beach

**E. coli:** > 406 cts/100 mL – surface waters

**Turbidity:** > 10 NTU above natural level

**pH:** 6.5-8.0 (unless naturally occurring)

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m	Turb. ntu	pH
Begun Inlet			17	81.3		12		2.08	5.69
Colburn Inlet			32	141.4		24		1.13	5.82
Converse Inlet			9	57.0		16		0.89	5.83
Dapkas Inlet			14	82.4		9		0.80	6.24
Goddard Inlet			16	86.2		10		1.07	5.43
Loon Bay			11	61.3		12		0.91	5.87
Marina Inlet			20	94.0	10	15		1.31	6.11
48 Dolly Lane				89.6	10	16		1.29	5.89
State Line Inlet			14	81.6		18		2.68	6.23
State Line Intermittent Stream			14	81.1		7		0.71	6.28
Epilimnion	2.25	6.66	16	79.4		10	2.20	0.94	6.11
Hypolimnion				80.3		12		2.07	5.71
Swan Point Inlet			15	85.4		17		1.20	6.13

#### HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.

